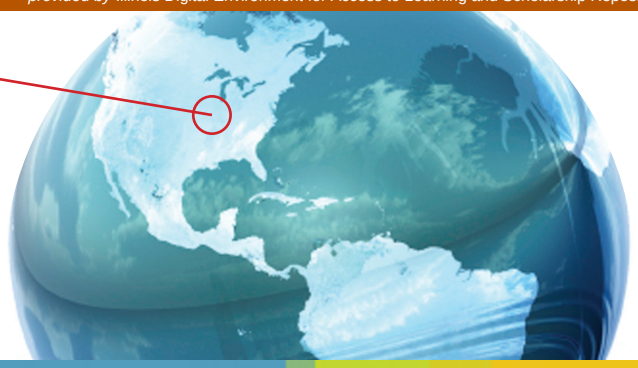
Change and the Heartland

How Climate Change Will Affect the Midwest

Big issues, bite-sized lessons



Will Urban Planning Change with the Climate?

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As our cities expand, so do the ills that accompany unplanned growth and dependence on automobiles. These hidden costs have begun to reveal themselves in the form of auto congestion, productivity losses, dwindling municipal budgets (and consequently higher taxes), respiratory illnesses, rising gasoline prices, accident deaths, obesity, and climate change.

Climate Change Hastened by Grow–Build–Drive Cycle of Conventional Urban Planning

The connection between land use and climate change thus grows unfortunately apparent as we destroy increasingly more natural carbon sinks (prairie, wetlands, and forest) to clear land for constructing more buildings (that we burn fossil fuels to heat, cool, and power) to which we must drive (burning more fossil fuels).

Reversing this unsustainable grow–build–drive cycle will require fundamental changes in the way our communities plan and operate.

But will we recognize a better alternative when we see one? Can we be sure that the decisions we make today don't imperil our children's ability to make decisions in the future? Can we determine the future effects that our complex and ever-evolving urban areas will have on valued existing services?

Yes, we can, but doing so requires our being able to . . .

- Forecast potential future changes to our cities
- Identify important existing resources and services
- Understand how the potential future changes will affect these resources and services

Key Term

Scenario Planning

Scenario planning is a method of strategic planning that some organizations use to make flexible, long-term plans. Typically this technique relies on systems thinking to develop plausible scenarios or story lines that describe causal relationships between factors of concern.

Scenarios are designed so that they are both possible and uncomfortable. The goal is to help communities anticipate hidden weaknesses and inflexibilities in organizations along with deficiencies in policy or infrastructure.

Considering Multiple Alternative Scenarios Improves Land Use and Urban Planning

To address this challenge, our multidisciplinary research team at the University of Illinois is developing tools that groups can use to engage in forecasting and scenario building to predict the likelihood of land use change throughout a region and to understand the localized urban impacts of that change.

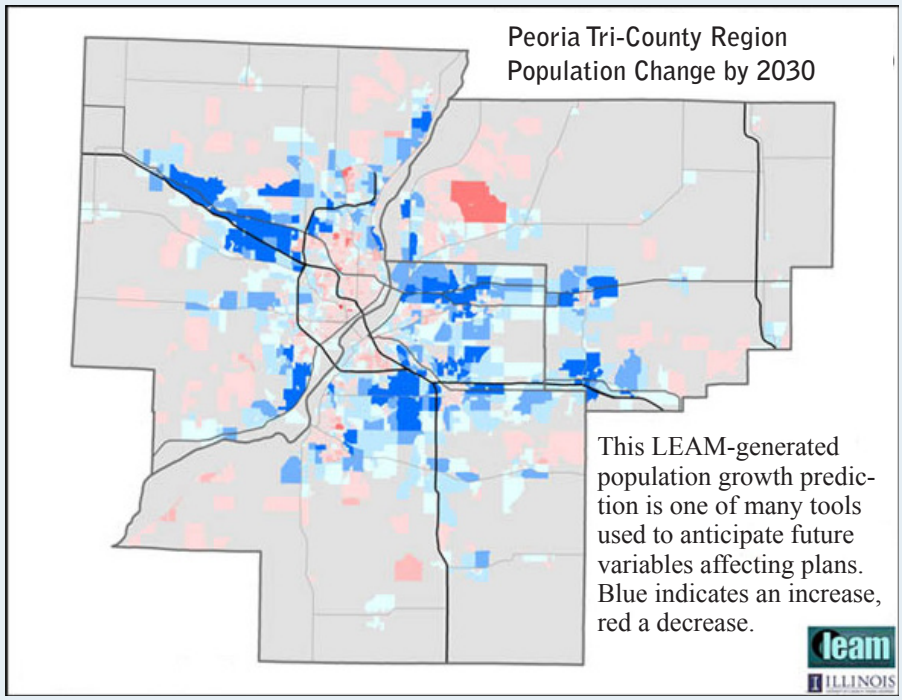
Developing tools to enable planning is essential to address "wicked problems" like climate change. Such problems are complex, and they include aspects and outcomes that are ambiguous and tradeoffs that can be morally and politically divisive. Other systemic problems that are similarly "wicked" include urban crime, the AIDS virus, racism, and the lack of affordable housing. Like with climate change, their effects on society can be mitigated, to be sure, but solutions will likely require foresight and generations of public investment.

Cities Plan for a Changing Climate

Issue 1:5
http://hdl.handle.net/2142/16445

Navigating the uncertainty of wicked problems requires a flexibility and persistence that cannot be addressed in a single round of policy. Accordingly, the field of urban planning has begun to adopt a new framework of problem solving called "scenario planning" that instead forecasts multiple futures so that local leaders can prescribe multiple solutions to a spectrum of possible problems. Scenario planning helps communities engage in difficult decision making by forecasting multiple likely futures, identifying the challenges inherent in each, and crafting policies and plans to address those challenges.

Predicting Population Growth



New Tools Allow Flexibility, Community Input, and Continuous Calibration of Land Use Plans

Our tool, the Land Use Evolution and Impact Assessment Model (LEAM), develops scenarios that let users glimpse likely futures. Its greatest value is that it can be used for reiterative planning where local planners, land owners, and resident stakeholders participate in developing scenarios.

LEAM was used in Peoria, Illinois, to help citizens and planners arrive at a consensus on infrastructure and investment. The scenarios developed helped reveal and resolve critical environmental stresses that could have been created by proposed development actions and exacerbated by climate change.

Peoria is a central Illinois city of about 300,000 people nestled in the Illinois River valley and surrounded on all sides by prime farmland. New planning questions emerged as it became clear that the proposed infrastructure strategy would conflict with farmland protection and preservation of the scenic and environmentally sensitive river bluffs. Conflicts between community goals became apparent only when all three policies were modeled simultaneously. Simulations indicated that the farm protection strategy, a type of rural zoning, would increase the likelihood of development on the treasured bluffs.

By simply enacting bluff protection before enacting the rural zoning standards, both the bluffs and the rural farmland were preserved. The importance of farmland protection did not change; the question became how to accomplish the goal without compromising local resources.

Scenario Planning and Community Input Lead to Good Policy

No single panacea can equitably mitigate and adapt to climate change and the host of environmental issues confronting our communities. We can, however, engage in flexible, evolutionary planning that balances ecological, economic, and social needs in order to address these "wicked" planning problems. Even though we cannot literally travel into the future, new simulation technology can help us visualize the outcome of different plans, policies, and strategies before we've invested precious public resources to implement them. Planning support systems can help democratize the planning process by enabling entire communities to evaluate and contribute to these plans and participate in the decision-making process that results in wise policy and investment.

About the Researchers

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